International Journal of Computer Science Engineering and Information Technology Research (IJCSEITR)
ISSN(P): 2249-6831; ISSN(E): 2249-7943
Vol. 4, Issue 2, Apr 2014, 233-236

A CONTENT BASED IMAGE RETRIEVAL USING STATISTICAL TECHNIQUE

NAVNEET KAUR[1], MEENAKSHI SHARMA[2] & PANKAJ SHARMA[3]

[1]CSE, SSCET Badhani, Punjab, India

[2]Department of Head, CSE, SSCET Badhani, Punajb, India

[3]Assistant Professor, CSE, SSCET Badhani, Punjab, India

ABSTRACT

Content Based Image Retrieval system is a system in which the retrieval is based on the content and associated information of the image. This unit of information is basically a numerical value and hard to interpret in terms of human understanding. Therefore, there is an urgent need to remove the barriers to have a streamlined retrieval system which works for humans and with humans. The main elements on which performance of any CBIR system depends are the semantic, sensory gaps and above all the treasure of knowledge it provides, which validated technical and scientific information like the shape is of leafs. In this paper we have developed a system that works and that focuses on this specific domain in biodiversity.

KEYWORDS: CBIR, Color, Texture, Shape, Feature Extraction, Matching, Recall, Precision

INTRODUCTION

Content based image retrieval system has been an active and fast growing research area since 1990's[1]. CBIR is a technique for retrieving images based on the automatically derived features such as color, texture and shape.

Earlier techniques were based on the textual annotations of the images. Firstly the images were annotated by text and then searched using a text based technique. However, in many situations textual annotation technique is time consuming and inefficient. As we know that images speak thousands of words so instead of textual annotation of images by keywords, images are annotated by their own visual features such as color, texture, shape etc.

Several image retrieval systems are now available such as IBM QBIC system, VIR Image Engine from Virage, MIT Photobook system, Chabot, Visual SEEk.

CBIR ARCHITECTURE

There are 2 basic steps involved in the CBIR system:

Feature Extraction: The first step is extracting the image features.

Matching: The second step is matching these extracted features to yield a desired image that is visually similar to the input image.

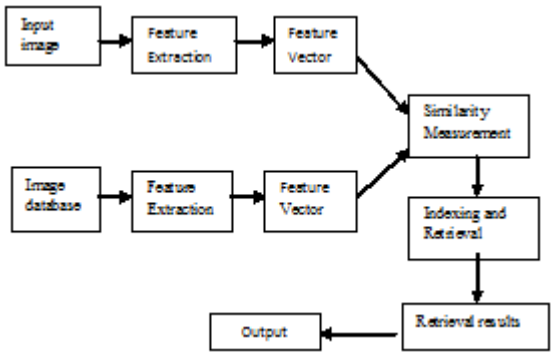


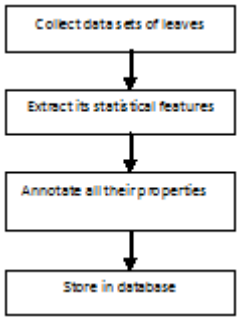
Figure 1: Architecture of CBIR [2]

Figure 1 shows the basic architecture of CBIR. Firstly all the images in the database undergo feature extraction. Image feature is basically the information relevant for solving the task. Image features can be low-level image features such as color, texture and shape or high level image features such as wavelets. The feature vector of all the images in the database is computed. The feature vector of the query images is compared with the feature vector of all the images stored in the database. The common way to find out the image similarity is the color distance. The similar images are retrieved and displayed on the screen.

THE PROPOSED METHODOLOGY

The proposed methodology is shown in the Figure 2. below

PHASE 1



PHASE 2

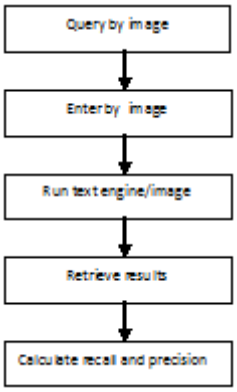


Figure 2: The Proposed Method

- **Collection and Acquisition of Images:** The research agenda was limited to the area that incorporates domain and biodiversity knowledge of leaf shapes using images.
- **Extraction of Statistical Features:** Mean, Standard deviation, Variance, skewness and kurtosis attributes have been used.
- **Annotation:** The annotation has been done by assigning values to length, breadth, thickness of images.
- **Storage Phase:** A file system (or file system) is used to control how information is stored and retrieved. Without a file system, information placed in a storage area would be one large body of information with no way to tell where one piece of information stops and the next begins, therefore , we design proper file and folder structure to store the annotation sets and statistical features in Matlab file format (.mat) and images in jpg format in separate folders enclosed in the main project folder making system simple and easy for retrieval for our CBIR to work with .For Indexing the content of annotation and image data with used data structures.
- **Retrieval Phase:** Since**,** the proposed system helps to streamline the man- machine interaction by providing information which is relevant, instrumental in nature, having rich description with directional and anatomical information annotated along with the result sets and is also validated against the low level statistical features which are nothing but numeric values were mapped using scientific rules of classification of leafs is comprehendible in simple human dialects

RESULTS

To check the performance of the algorithm we have used recall and precision.

Recall=

$$\frac{no\ of\ relevent\ images\ retrieved}{total\ no\ of\ images\ retrieved}$$

Precision=

$$\frac{no\ of\ relevant\ images\ retrieved}{total\ no\ of\ relevant\ images\ in\ database}$$

The proposed algorithm is implemented on the Matlab tool and has been tested for the various images stored in the database.

The performance curve shown in the Figure 3 Shows the retrieved results of the queries retrieved. The view shows that average precision values lies 65.7 % around which is considered as effective retrieval.

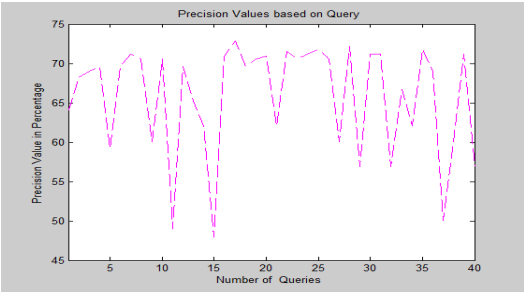


Figure 3: Precision Performance Curve

Figure 4 shows the recall performance curve. The recall value of any system will be high if the selection process of the dataset images have been done very carefully and pains have been taken to select domain specific illustrations depicted in image instances. The recall value is close to 33% which is considered as effective. Based on the formula the average recall value calculated is 30.39%

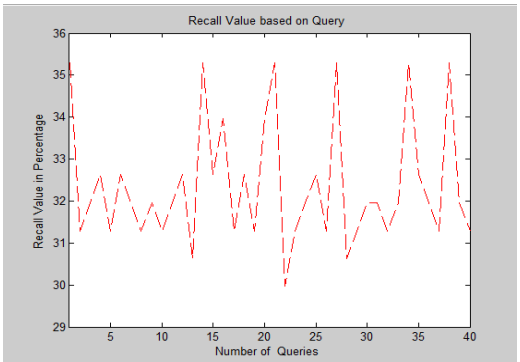


Figure 4: Recall Performance Curve

CONCLUSIONS

In this paper, the CBIR system for BIODIVERSITY LEAF domain has been implemented. The basic idea of CBIR in the proposed work was to give access to the full information which may go as a suggestion in helping the user in accomplishing some useful technical task, thereby increasing his expected benefit from retrieving information from the content of the image and summary associated with the image in the integrated view. The proposed system helps to streamline the man- machine interaction by providing information which is relevant, instrumental in nature, having rich description with directional and anatomical information annotated along with the result sets.

REFERENCES

1. Sanjay Patil, Sanjay Talbar “Content based image retrieval using various distance metrics”, Springer, 154-161, 2012.
2. Hossein Sadeghian Nejad, Jamshid Shanbehzadeh, Abdolhossein Sarafzadeh, “Translation and rotation invariant content based image retrieval system”, IMECS 2012,March14-16,2012
3. B. Celia, I. Felci Rajam,” An efficient content based image retrieval framework using machine learnin technique”, Springer, 162-169, 2012.
4. K.Susheel Kumar, Pardeep Kumar Saroj, R.C.Tripathi, “An adaptive image retrieval system with relevance feedback and clustering”, Springer, 85-92, 2012.
5. Dr. H. B. Kekre, Mr. Dhirendra Mishra Ms.Stuti Narula, Ms.Vidhi Shah, “Color feature extraction for CBIR”, IJEST, Vol. 3 No.12 December 2011
6. Swati V.Sakhare, Vrushali G.Nasre, “An efficient approach for content based image retrieval by wavelet and gabor” IJCA